HIGHER TECHNICAL INSTITUTE

ELECTRICAL ENGINEERING COURSE

DIPLOMA PROJECT

DEVELOPMENT OF THE CONTROL SCHEME OF A STAMPING MACHINE USING PROGRAMMABLE LOGIC CONTROLLERS

by

IAN G. BALTHAZAR (E/968)

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SUBMITTED BY:

IAN G. BALTHAZAR

In partial fulfilment of the requirements of the award of the Diploma of the Technician Engineer in Electrical Engineering of the Higher Technical Institute of Cyprus.

PROJECT SUPERVISOR: Mr I. Demetriou Electrical Engineering lecturer H.T.I

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PREFACE

Before embarking on this project I must confess my knowledge of this particular area of technology was miniscule. Fortunately for me PLCs features on the 2nd semester syllabus of the optional subject: Advanced Control of Machine Drives. I had by then obtained a book on the subject and began digesting as much as possible about this topic. The more I delved the more I became gripped by the powerful and ever expanding world of the programmable controller.

Hands-on experience did prove vital in further nurturing my interest with this subject area. Using the Allen Bradley SLC 500 the virtual experience became vividly appanent. With the countless features provided on the PLC literally any complex control setting that one could conjure up was possible. After experimenting and mastering programming with the handheld terminal I then boldly ventured into programming with a personal computer and the APS software provided. This was another world in itself with various other features and possibilities unheard of within the hand held terminal. A feeling of satisfaction was quickly gained from the APS software since I managed to completely manoever its operation without the benifit of a dedicated manual much unlike the hand held terminal.

Throughout the several weeks of Thursdays spent in the Lab with the PLC I feel its safe to say that I have grown an emotional attachment to PLCs as a whole. Further research with literature provided by the Library plus other investigative means have helped to galvanize my relationship with PLCs.

Working out the study program was an enjoyable challenge. But best of all was seeing the fruits of my labour when the indicator lamps of the simulator glowed in direct response to my ladder program.

One point must be made clear. This study should in no way be taken as a comprehensive look at PLC's. The world of the PLC is quite extensive indeed. Further details are available from specialist books on the subject and from technical manuals and specification sheets provided by manufacturers. I believe the true purpose of this study have been served and that was to look at an approach to a particular application of the PLC. Nevertheless I must admit few other benefits were accrued along the way.

OBJECTIVES:

1. To examine the characteristics and capabilities of programmable controllers.
2. To investigate the programming capabilities of a "ladder language".
3. To develop an application programme using the programmable controller for the control of a stamping machine.
4. To provide costing for such system and compare it to conventional methods.

CONTENT AND STRUCTURE

The content is based on the above factors. Much effort is made to avoid the reader from being bogged down with irrelevant details. A straight to the point approach is adopted with examples diagrams and illustrations where necessary to facilitate explanation.

Chapters 1 and 2 give a general overview of the PLC and tis programming. Chapter 3 concern the core of the project and gives the steps leading to the final outcome. Chapter 4 gives a detailed explanation of the program on a rung by rung basis. The topic of costing is viewed in chapter 5.

The appendices contain technical details on typical programmable controllers. A few details concerning the SLC 500 and also a glossary of technical terms.

ACKNOWLEDGEMENTS

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Last but definitely not least, thanks go out to my family my most enthusiastic and boisterous cheerleaders, especially my dearest mum who through her constant stream of correspondence demonstrates her unflagging support above and beyond the call of maternal duty.

Ian G. Balthazar.

Dedicated to my wonderful family. The strength of my life.

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